

Chapter Thirteen: Plant Processes

Teacher Notes

Lesson One: Photosynthesis

- Capturing Light Energy
 - Photosynthesis-the process by which plants, algae, and some bacteria use sunlight, carbon dioxide, and water to make food.
 - Chlorophyll-a green pigment that captures light energy for photosynthesis.
- Making Sugar
 - light energy is used to help form glucose molecules; oxygen gas is given off by plant cells
 - six molecules of carbon dioxide and six molecules of water are needed to form one molecule of glucose and six molecules of oxygen.
- Getting Energy from Sugar
 - glucose molecules store energy; plant cells use this energy for their life processes.
 - Cellular Respiration-the process by which cells use oxygen to produce energy from food.
 - the excess glucose is converted to another sugar called sucrose or stored as starch.
- Gas Exchange
 - Stoma-one of many openings in a leaf or a stem of a plant that enable gas exchange to occur.
 - each is surrounded by two guard cells that act like doors opening and closing the stoma
 - when stoma is open carbon dioxide enters the leaf
 - the oxygen produced during photosynthesis exits the leaf through stoma
 - water vapor also exits through stoma
 - Transpiration-the process by which plants release water vapor into the air through stomata.
 - most water absorbed by roots replaces lost water
- The Importance of Photosynthesis
 - organisms and plants that use photosynthesis are the base of food chains
 - the chemical energy that is stored in plants during photosynthesis may become energy for the animals that eat them.
 - plants produce oxygen through photosynthesis which animals need for survival

Lesson Two: Reproduction of Flowering Plants

- Fertilization
 - takes place within flowers
 - pollination-when pollen moves from anthers to stigmas
 - usually wind or animals move pollen from one flower to another
 - pollen contains sperm; after pollen lands on the stigma a tube grows from each pollen grain. The tube grows through the style to an ovule which are found inside the ovary. Each ovule contains an egg. Sperm from the

pollen grain move down the pollen tube and into an ovule. Fertilization happens when a sperm fuses with the egg inside an ovule.

-From Flower to Fruit

-after fertilization, the ovule develops into a seed.

-the seed contains a tiny, undeveloped plant; the ovary surrounding the ovule becomes a fruit.

-as fruits ripen it protects seeds.

-seeds are spread by animals eating fruit and leaving the seeds to grow into new plants.

-From Seed to Plant

-Once a seed is fully developed the young plant inside the seed stops growing.

The seed may become dormant.

-Dormant-describes the inactive state of a seed or other plant part when conditions are unfavorable to growth.

-when seeds are dropped or planted in a suitable environment the seeds sprout

-to sprout most seeds need water, air, and warm temperatures

-each plant has a ideal temperature from growth

-Other Methods of Reproduction

-Flowering plants may reproduce asexually and don't need flowers

-Plantlets-tiny plants grow along the edges of a plant's leaves; these fall off and grow on their own.

-Tubers-underground stems, or tubers, can produce new plants after a dormant season.

-Runners-above-ground stems from which new plants can grow are called runners.

Lesson Three: Plant Response to the Environment

-Plant Tropism

-Tropism-the movement of all or part of an organism in response to an external stimulus, such as light.

-Light

-phototropism-a change in direction a plant grows that is caused by light

-Gravity

-gravitropism-plant growth change in response to the direction of gravity

-Seasonal Responses

-plants living in regions with cold winters can detect the change in seasons

-How? They respond to the change in the length of day

-Length of Day

-short-day plants-plants that grow better when night is longer than day

-example-poinsettias

-long-day plants-plants that grow best when day is longer than night.

-example-clover, spinach, and lettuce

-Seasons and Leaf Loss

-evergreens-trees that shed leaves year round so that there are always some on the tree.

-deciduous trees-trees that lose all of their leaves around the same time of year

-Seasons and Leaf Color

-deciduous trees usually have leaves that change color before they fall off because the green chlorophyll breaks down.